May 27, 1958 E. W. HAGADORN 2,836,127

APPARATUS FOR SELECTIVELY MOVING SUPPORT MEMBERS

Filed Dec. 27, 1954 3 Sheets-Sheet 1

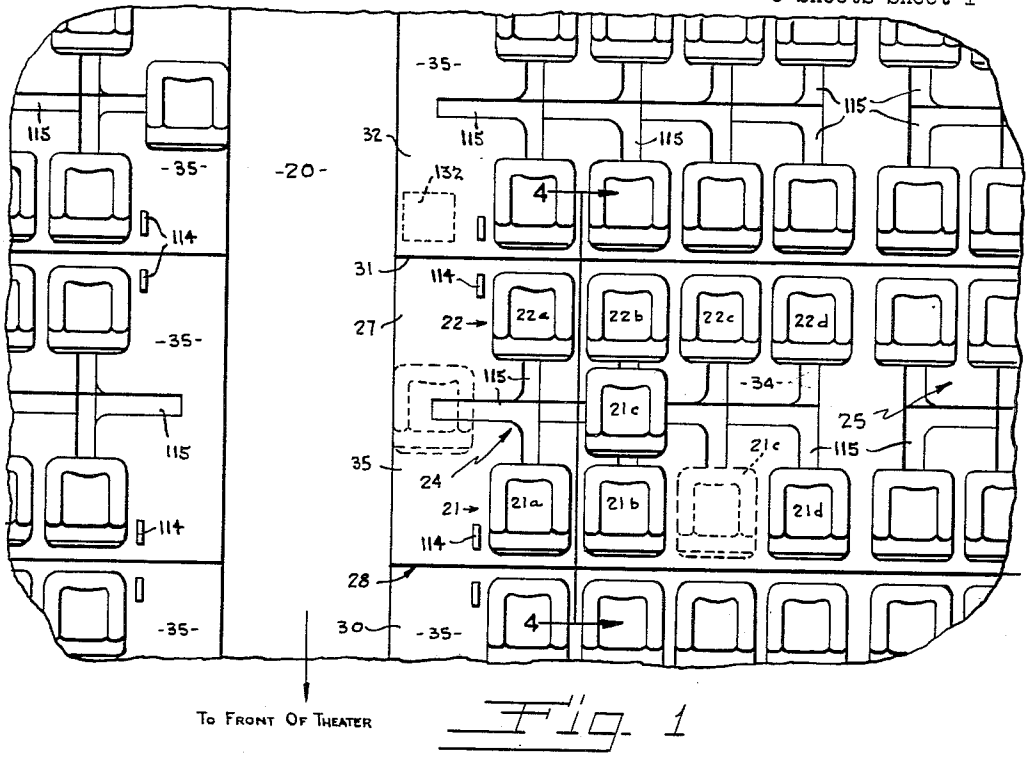


Fig. 1

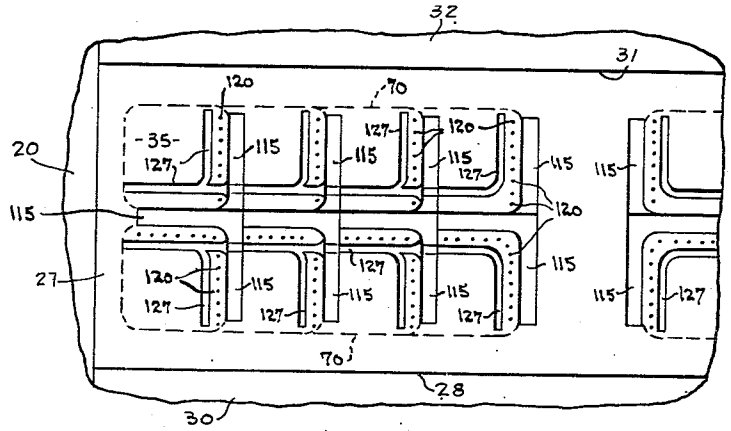


Fig. 2

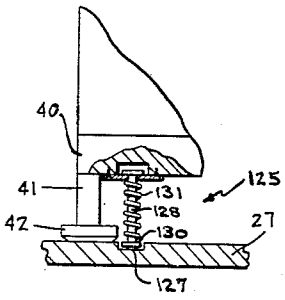


Fig. 3

INVENTOR.
ELMORE W. HAGADORN
BY
Richard, van K. Bruna
Attorney

May 27, 1958 E. W. HAGADORN 2,836,127

APPARATUS FOR SELECTIVELY MOVING SUPPORT MEMBERS

Filed Dec. 27, 1954 3 Sheets-Sheet 2

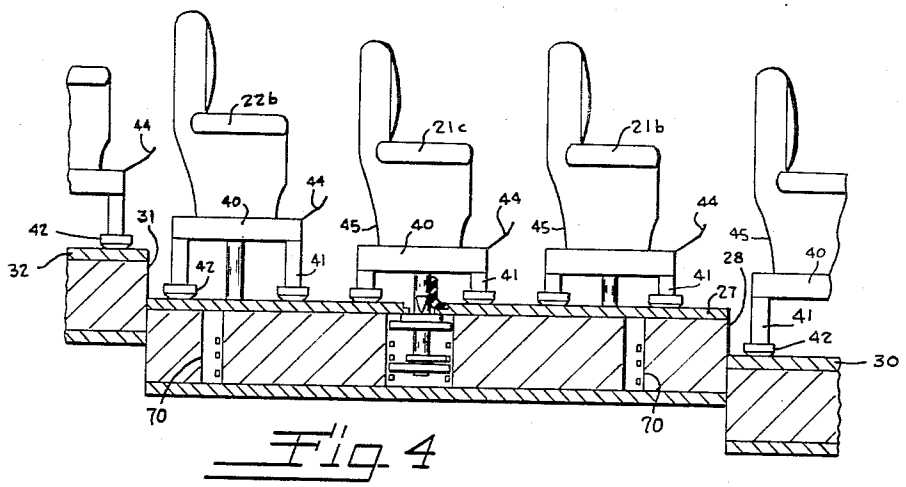


Fig. 4

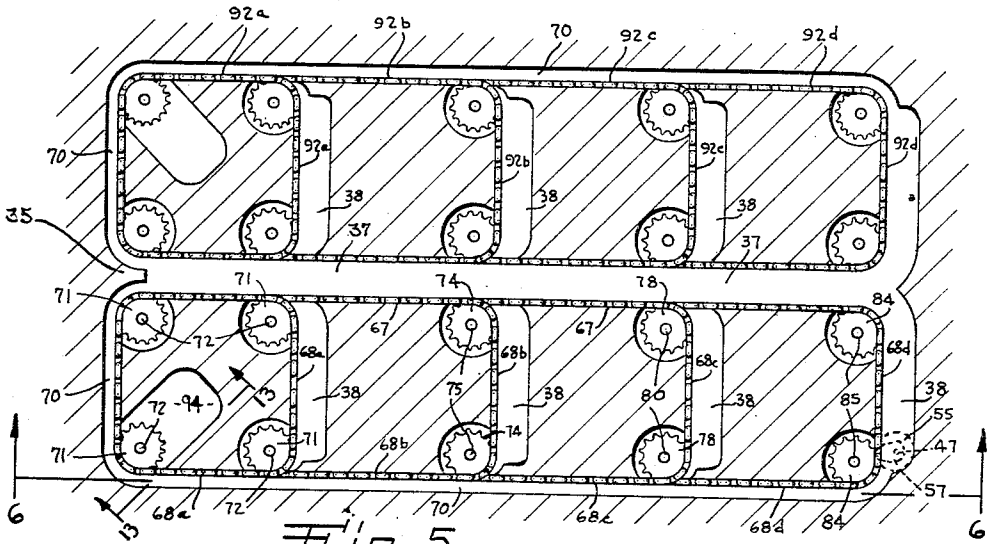


Fig. 5

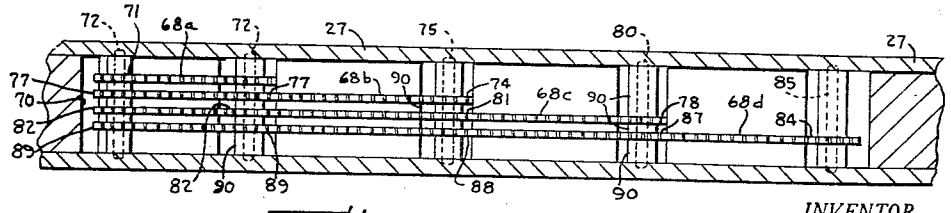


Fig. 6

INVENTOR.
ELMORE W. HAGADORN
BY
Richard von K. Bruns
Attorney

May 27, 1958 E. W. HAGADORN 2,836,127

APPARATUS FOR SELECTIVELY MOVING SUPPORT MEMBERS

Filed Dec. 27, 1954 3 Sheets-Sheet 3

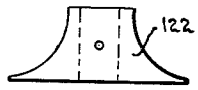


Fig. 9



Fig. 10

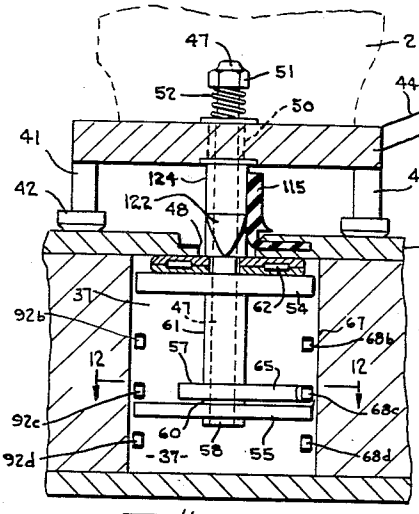


Fig. 7

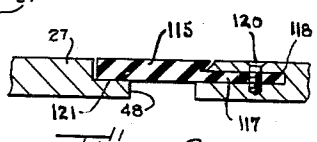


Fig. 8

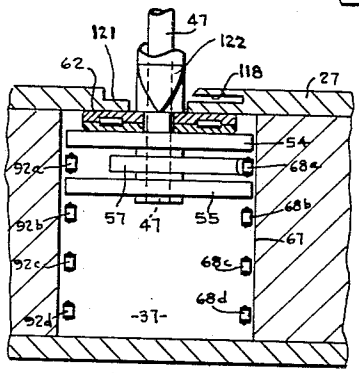


Fig. 11

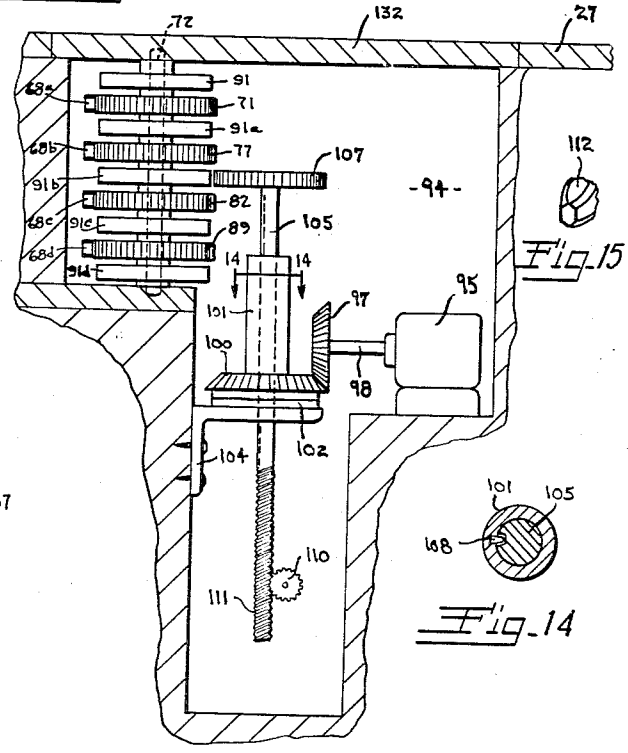


Fig. 13

Fig. 15

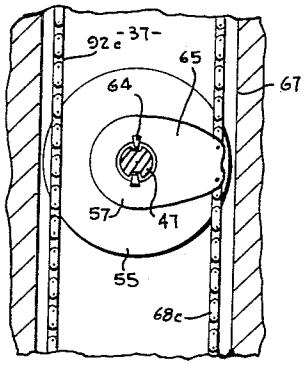


Fig. 12

Fig. 14

INVENTOR.
ELMORE W. HAGADORN
BY
Richard von K. Bruns
Attorney

United States Patent Office 2,836,127 Patented May 27, 1958

2,836,127

APPARATUS FOR SELECTIVELY MOVING SUPPORT MEMBERS

Elmore W. Hagadorn, Solvay, N. Y., assignor to Finishine Laboratories, Inc., Syracuse, N. Y., a corporation of New York

Application December 27, 1954, Serial No. 477,893

8 Claims. (Cl. 104—25)

This invention relates to apparatus for selectively moving any one of a group of support members out of its position in the group to a common loading and unloading point adjacent the group, and from thence back to its original position, the other members in the group remaining stationary during such movement. More particularly, the invention relates to apparatus for selectively moving any seat in a row of theatre seats back and forth between its normal position in the row and a loading and unloading point adjacent a main aisle.

In recent years it has become the practice of the great majority of motion picture theatres to run a continuous program of entertainment for periods of twelve hours or more with no break between complete performances. This practice has led the patrons to enter and leave the theatre at irregular intervals throughout a performance since they can normally be assured of seeing a complete show regardless of their time of arrival. While such an arrangement may be a convenience to the average theatre patron, the continuous entering and leaving of seats by a portion of the audience is often a source of annoyance to others in the audience who are seated and engrossed in the performance. Accordingly, it is the principal purpose of this invention to provide an apparatus for selectively moving any given theatre seat from its position in a row to a point adjacent the aisle where the seat may be loaded or unloaded with a minimum of disturbance to the audience in the remaining seats.

The applicant is aware of the fact that various movable seating arrangements for theatres have been developed heretofore. However, none of these developments have been used to any extent or met with any widespread enthusiasm since they have either proved to be impractical or have introduced further problems by reason of their own design. In one such arrangement, for example, each seat is mounted on a hydraulically actuated piston so that it can be moved vertically between the auditorium and a loading and unloading room below the auditorium. Since the seat must pass through a trap door in the auditorium floor and the occupant is suspended several feet in the air during such movement, this arrangement is quite obviously impractical for safety reasons. Other arrangements have made provision for mounting a group of seats on a rectangular or eliptical track so that the seats may be simultaneously shifted to position a particular seat adjacent the aisle, and in still another arrangement an empty seat at the "exit" end of a row is moved beneath the row to the "entrance" end thereof while the remaining seats are moved in the opposite direction to make room for the transferred seat. All of these last-mentioned arrangements have the disadvantage of requiring movement of all of the seats in a group or row to effect the transfer of a particular seat to the loading point, such mass movement being generally undesirable from the audience viewpoint as well as defeating to a large extent the purpose of the arrangement.

With the foregoing and other considerations in view, it is the primary object of the present invention therefore to provide an apparatus for selectively moving any seat in a group of theatre seats between its normal position in the group and a loading and unloading point adjacent the theatre aisle, the other seats in the group remaining stationary during such movement.

Another important object of the invention is to provide apparatus for individually moving any given seat in a group of theatre seats between its normal position in the group and a loading and unloading point adjacent the theatre aisle in such a manner as to cause a minimum amount of disturbance or annoyance to the audience in the other seats in the group even though the seat is occupied during such movement.

A further important object of the invention is to provide apparatus for selectively moving any seat in a group of theatre seats arranged in two rows, along a central passageway between the rows, to a common loading and unloading point adjacent the theatre aisle, the other seats in the group remaining stationary during such movement.

A still further object of the invention is to provide apparatus for selectively moving any seat in a group of theatre seats arranged in two rows, along a central passageway between the rows, to a common loading and unloading point adjacent the threatre aisle, the apparatus including a separate drive member for each seat and a single prime mover associated with each row adapted to selectively actuate any one of the drive members for the seats in the row.

Another object of the invention is to provide apparatus for selectively moving any seat in a group of theatre seats arranged in two rows, along a central passageway between the rows, to a common loading and unloading point adjacent the theatre aisle, the seats being guided during such movement by a system of guideways including a central guideway positioned below the passageway and a plurality of branch guideways communicating with the central guideway, the drive members for each row of seats being arranged one above the other in the central guideway adjacent a side wall thereof.

Still another object of the invention is to provide apparatus for individually moving any given seat in a group of theatre seats between its normal position in the group and a loading and unloading point adjacent the theatre aisle, which apparatus is practical and economical to construct and operate, and is substantially free from harmful hazards to the patrons of the theatre.

Other objects and advantages will become apparent from the following detailed description read in conjunction with the accompanying drawings wherein like reference numbers refer to corresponding parts in all the views.

In the drawings:

Figure 1 is a fragmentary plan view of the seating area and seats in a theatre or auditorium incorporating one possible embodiment of the apparatus of the invention;

Figure 2 is a fragmentary plan view of a portion of the seating area shown in Figure 1 with the theatre seats removed;

Figure 3 is an enlarged fragmentary front elevation of a theatre seat showing the alignment mechanism therefor;

Figure 4 is an enlarged vertical section through a portion of the theatre seating area and seats taken along line 4—4 of Figure 1;

Figure 5 is an enlarged plan view of the guideways and drive members for a group of two rows of seats, the view corresponding to Figure 2 with the seat platform or top floor covering removed;

Figure 6 is a vertical section taken along line **6—6** of Figure 5;

Figure 7 is an enlarged vertical section corresponding to the center portion of Figure 4 showing the details of the driving means and guideway arrangement for the third seat in a row;

Figure 8 is a detailed vertical section showing the closing means for the guideway top opening;

Figure 9 is a side elevation of the splitter element employed to displace the closing means for the guideway top opening;

Figure 10 is a perspective view of the splitter element;

Figure 11 is an enlarged vertical section corresponding to Figure 7 showing the drive means and guideway arrangement for the first seat in a row;

Figure 12 is a horizontal section taken along line **12—12** of Figure 7;

Figure 13 is a detailed side elevation of the prime mover for a row of seats and selective engagement mechanism therefor;

Figure 14 is a horizontal section taken along line **14—14** of Figure 13; and

Figure 15 is a detailed perspective view of a gear tooth on the selective engagement gear.

While the drawings and detailed description to follow particularly describe the invention with relation to apparatus for selectively moving theatre seats, it will be understood as the description proceeds that the apparatus herein disclosed can be utilized generally to move a preselected object of any kind between the normal position of the object in a group or pattern and a point removed from the group. The drawings and detailed description are therefore not to be taken in a restrictive sense since they set forth but one typical embodiment of the invention for the purpose of disclosure.

Having reference to the drawings and in particular to Figure 1, **20** indicates a main aisle of the theatre, the aisle being flanked by a plurality of rows of seats in the usual manner. In accordance with the invention, the seats are divided into groups or sections, each such group or section having its own seat moving apparatus. Each group of seats and its moving apparatus can therefore be considered as a complete unit and since all of these units are of substantially identical construction, a description of one will suffice for the others.

The seats in each group are arranged in two rows and, as illustrated in the drawings, each row contains four seats although a greater or smaller number of seats can be employed if desired. In Figure 1, rows **21** and **22** containing seats **21***a*, **21***b*, **21***c*, **21***d* and **22***a*, **22***b*, **22***c*, **22***d*, respectively comprise one complete group which is generally designated by the reference number **24**. Normally, there will be two such groups of seats in side by side relation between each consecutive pair of main aisles **20**. All of the seats in group **24** and its adjacent side group **25** are supported on a substantially horizontal platform **27** which is connected by a riser **28** to a lower platform **30** ahead of it and by a riser **31** to a higher platform **32** behind it, as is best shown in Figure 4.

Rows **21** and **22** are spaced apart to form a central passageway **34** therebetween of sufficient width to permit a seat to be moved along the passageway with clearance between the remaining seats in the rows. In Figure 1, seat **21***c*, the third seat in the front row of the group, is shown in the course of movement along this passageway, the seat having been moved out of its row position indicated by dash lines. Rows **21**, **22** are also spaced a distance approximately equal to the width of one seat from the main aisle **20** to provide a loading and unloading space or zone **35** adjacent the aisle.

With the arrangement just described, an empty seat in either of the rows **21** or **22** can be moved into the passageway **34** and therealong to the loading and unloading zone **35** where a patron can occupy the seat without having to walk in front of those already seated.

Thereafter, the seat can be returned along the passageway to its original position in the row, its occupant being seated during such movement so that the remainder of the audience is not disturbed. When one of the audience wishes to leave his seat, the foregoing procedure is simply reversed, the person remaining in the seat until it has been moved out to the loading and unloading zone at which time he can rise and depart without blocking the view of others. Throughout the movement of any seat between its row position and the loading and unloading zone, the seat continues to face the front of the theatre due to mechanism to be described in detail hereinafter.

The seats in each group are guided in their movement to and from the loading and unloading zone **35** by means of a central guideway and a plurality of branch guideways located beneath the theatre floor or platform supporting the group. The central guideway **37** extends below the central passageway **34** between the seat rows, in vertical alignment with the centerline thereof, and terminates below the loading and unloading zone **35**, as indicated in Figures 1 and 2. This guideway communicates with a plurality of branch guideways **38**, Figure 5, each branch guideway extending outwardly at substantially right angles from the central guideway and terminating at a point below one of the seats in the rows. With this construction, there is a continuous guideway extending between each seat in the group and the loading and unloading zone **35**.

The individual seats are preferably of the type having storage space therein for the occupant's coat, hat, rubbers, and the like, as disclosed in my copending application Ser. No. 465,285, filed October 28, 1954, now Patent No. 2,759,529, dated August 21, 1956. However, non-storage chairs of any of the conventional types commonly used in theatres and auditoriums may also be used with the apparatus disclosed herein without in any way changing the scope of the invention. To facilitate movement of the seats, each one is mounted on a support member **40**, Figures 4 and 7, having legs **41** which terminate in runners, casters, or the like. As shown in the drawings, the legs **41** are provided with runners **42** of some suitable material such as polished hard wood to enable them to slide smoothly and quietly over the floor or platform which supports the group of seats.

Since both of the rows **21** and **22** comprising the seat group **24** are supported on the same platform **27**, Figure 4, the support members **40** for the rear row of seats **22** are provided with longer legs **41** than the support members for the front row of seats **21** to permit those sitting in the rear row to have a substantially unobstructed view of the screen or stage. This arrangement, together with the stepped platform arrangement previously referred to, results in a gradual elevation of successive rows of seats from front to rear as is customary in modern theatres and auditoriums. Figure 4, which shows seat **21***c* in the course of movement along the central passageway **34** between the rows, also indicates the preferable amount of clearance between the seats during such movement. Each seat is provided with a foot rest **44** mounted on its support member **40**, and the back walls of the seats are inwardly curved as indicated at **45** to insure adequate clearance for the feet of those in the seats behind. While the foot rests **44** are shown in fixed position in the drawings, they can if desired be pivotally secured to the support members and biased to spring up into a substantially vertical position when not in use. The advantage of the latter arrangement, of course, is that it would facilitate an exodus between the seat rows of adjacent groups in the event of an emergency such as a fire or the like.

The drive means to move the seats back and forth between their normal positions in the group and the loading and unloading zone **35** comprises an individual drive member for each seat positioned in the guideway sys-

tem, a drive connection between the support member 40 for each seat and its drive member, and a prime mover to actuate the drive member. The drive member for each seat, as shown in the embodiment of the invention disclosed herein, is an endless chain although other motion transmitting means such as a cable or the like could also be used. The drive connection between the support member and chain includes a spindle depending from the support member and a chain connecting element operably secured thereto.

Referring to Figure 7, which is an enlarged, detailed section corresponding to the central portion of Figure 4, the spindle is indicated at 47 and extends downwardly from the support member 40, through an opening 48 in the platform 27, and into the guideway 37. The spindle is secured to the support member so as to permit it to rotate relative thereto and to this end, passes through a bushing 50 in the member. Above the support member, a nut 51 is threaded on to the end of the spindle, a compression spring 52 being positioned on the spindle between the nut and the member for a purpose to be described hereinafter. Within the guideway 37, upper and lower guide rollers 54, 55 are mounted for free rotation on the spindle, and positioned therebetween is the chain connecting element 57 which is fixed to the spindle in a manner to be described.

The lower guide roller 55 is retained on the spindle by means of a fixed collar 58 and is separated from the chain connecting element by a spacer or washer 60. The upper guide roller 54 is spaced from the chain connecting element by a sleeve 61 which holds it against a thrust bearing 62 located between the roller and platform 27. Chain connecting element 57, Figure 12, is loosely keyed to the spindle as indicated at 64 and is provided with a lobe 65 to which the ends of the drive chain are attached. With this arrangement, movement of the chain is transmitted through the spindle 47 to the support member 40, the guide rollers 54, 55 bearing against and rolling on the guideway sidewall 67 during such movement. The guide rollers, thrust bearing 62 and support member legs 41 all serve to stabilize the support member as motion is transmitted from the chain thereto. In this connection, the nut 51 may be adjusted against the spring 52 to maintain upper guide roller 54 in close engagement with thrust bearing 62, the spring and nut connection also having the secondary purpose of providing some flexibility between the support member and drive means to compensate for any unevenness in the surface of the platform as the member travels thereover.

Since the seat shown in Figure 7 is seat 21*c* (see also Figures 1 and 4), its chain drive member is designated by the reference number 68*c*. The arrangement of the chain drive members for all of the seats in the group is best shown in Figures 5 and 6, the former being a plan view with the platform 27, or top floor layer, removed. In Figure 5, it will be seen that chain 68*d*, the drive member for the fourth seat 21*d* in row 21, extends from the outer end of the fourth branch guideway 38, around an idler sprocket at the junction of the branch guideway and central guideway 37, and along the central guideway to the aisle terminal thereof, which terminal is located below the loading and unloading zone 35 as indicated in Figures 1 and 2. At the aisle terminal of the central guideway the chain passes around another idler sprocket and enters a narrower chain way 70 which communicates with the outer ends of all the branch guideways, terminating at the fourth branch for seat 21*d*. In this manner chain 68*d*, the ends of which are secured to the chain connecting element 57 for the seat 21*d* as indicated by dash lines in Figure 5, forms a complete loop or endless drive so that when the chain is selectively engaged by a reversible prime mover, in a manner to be described, the seat can be moved from its row position above the outer end of its branch guideway to the loading and unloading zone above the aisle terminal of the central guideway and back again. In the same manner, chain 68*c* for the third seat 21*c* forms a complete loop passing through the third branch guideway 38, chain 68*b* for second seat 21*b* forms a complete loop passing through the second branch guideway, and chain 68*a* for the first seat 21*a* forms a complete loop passing through the first branch guideway, each successive loop decreasing in length from the fourth to first branch guideway as shown in Figures 5 and 6.

In order to position all of the drive chains 68*a*—68*d* closely adjacent the side wall 67 of the central guideway 37, and thereby leave the center of the guideway free for the passage of the support member spindles 47, the chains are arranged one above the other in the guideway with chain 68*d* at the bottom and chain 68*a* at the top. To this end, a series of chain engaging idler sprockets are mounted on vertical spindles in the guideway-chain way system at each point that any chain changes direction. Thus, the top chain 68*a* engages idler sprockets 71 positioned near the upper ends of spindles 72. Similarly, chain 68*b* engages sprockets 74 on spindles 75, and also sprockets 77 positioned below the sprockets 71 on spindles 72. Chain 68*c* engages sprockets 78 on spindles 80, and also sprockets 81 and 82 positioned below sprockets 74 and 77 on spindles 75, 72, respectively. Chain 68*d* engages sprockets 84 on spindles 85, and also sprockets 87, 88 and 89 below sprockets 78, 81 and 82 on spindles 80, 75 and 72, respectively. While only the sprockets 84 and sprockets 89 adjacent the aisle are necessary for the operation of chain 68*d*, the sprockets 87, 88 and inner sprockets 89 are also provided since they serve to prevent excessive slack in the chain and can be mounted on spindles that are necessary to the other chains in the group in space that would not otherwise be utilized. Chains 68*c* and 68*b* are similarly provided for as above described.

With the foregoing arrangement, the spindle 47 for the fourth seat 21*d* extends almost to the bottom of the guideway so that its chain connecting element 57 is positioned opposite chain 68*d*, and its lower roller 55 engages the side wall of the branch and central guideways below the chain. Thus, the lower roller will occupy the space between the chain and the bottom of the guideway. The fact that the spindle extends below the level of the other chains, in the case of seat 21*d*, is of no concern since the spindle only trtvels in its own branch guideway and the central guideway and never crosses the other chains. For the thisd seat 21*c*, howeves, the spindle 47 is shorter and terminates just above the level of chains 68*d*, see Figure 7, so that as the seat moves from its branch guideway into the central guideway, and vice versa, it passes over chain 68*d* and does not interfere therewith. The lower roller 55 for this spindle is accordingly located between the levels of chains 68*c* and 68*d* as shown in Figure 7. For the second seat 21*b*, the spindle 47 is still shorter and terminates just above the level of chain 68*c* so as to clear the latter as the seat moves back and forth between its branch guideway and the central guideway. The lower roller 55 for this spindle is located between the levels of chains 68*b* and 68*c*. The arrangement for the first seat 21*a* is shown in Figure 11, a view corresponding to Figure 7 but showing seat 21*a* in the central passageway 34 between the rows instead of seat 21*c*. In this view it will be seen that the spindle 47 is quite short and terminates just above the chain 68*b* with the lower roller 55 on the spindle being located between the levels of chains 68*a* and 68*b*.

When the seat 21*a* passes from its branch guideway into the central guideway and its chain 68*a* passes around the sprocket 71 adjacent the intersection, its upper and lower guide rollers 54, 55 engage confronting rollers positioned between the sprockets on the spindle 72 so that guiding contact is not lost in making the turn even though the guideway sidewalls are cut away at that

point to provide sprocket wells for the sprockets. This construction is carried out on all of the spindles **72**, **75**, **80** and **85** adjacent the central guideway, wherever the rollers for any of the seats would make contact, and is shown for the purposes of illustration in Figure 13 even though a spindle adjacent the chain way as in Figure 13 would ordinarily be provided with small spacers **90**, Figure 6, between the sprockets rather than relatively large diametered rollers since the guide rollers for the seats never enter the chain way. In Figure 13, the rollers between the sprockets are designated by the reference numbers **91**, **91***a*, **91***b*, **91***c* and **91***d*. The top roller **91** will contact the upper guide roller **54** for each of the seats since the upper rollers are at the same level in every case. The lower guide rollers **55**, on the other hand, are positioned at different levels for each seat and roller **91***a* is therefore provided to contact the lower roller for seat **21***a*, roller **91***b* is provided to contact the lower roller for seat **21***b*, and so forth. While the chain drive arrangement has been described in connection with the seats in row **21** only, it will be understood that the arrangement is identical for the seats in row **22**, the chains **92***a*, **92***b*, **92***c* and **92***d* corresponding to seats **22***a*, **22***b*, **22***c* and **22***d* and extending along the opposite side wall of the central guideway, as shown in Figures 5, 7 and 11.

The chains **68***a*, **68***b*, **68***c* and **68***d* for the seats in row **21** are selectively actuated by a single prime mover and selective engagement mechanism diagrammatically illustrated in Figure 13. The prime mover and engagement mechanism are positioned in a well **94** which communicates with the sprocket well for the sprockets and spindle **72** located adjacent the main aisle and away from the loading and unloading zone **35** (the lower left hand spindle **72** as viewed in Figure 5). The prime mover is a reversible electric motor **95** having a bevel gear **97** secured to its drive shaft **98**. Gear **97** meshes with a bevel gear **100** fixed on the lower end of a sleeve **101**, the sleeve and gear being rotatably supported by some suitable means such as a thrust bearing **102** and bracket **104**. Passing through the sleeve **101** is a shaft **105** having a selective engagement gear **107** fixed on the upper end thereof. The shaft is keyed to the sleeve as indicated at **108**, Figure 14, so that it can move longitudinally relative thereto and yet will be driven by the motor through gears **97**, **100**. Longitudinal movement of shaft **105** is carried out by the means of a worm gear **110** which engages a worm **111** formed on the lower end of the shaft, the worm gear being actuated by a reversible electric motor (not shown). With this arrangement, the selective engagement gear **107** can be brought into mesh with any one of the sprockets **71**, **77**, **82** and **89** to drive the chain in engagement therewith when the motor **95** is in operation. The latter, of course, will be provided with a suitable step-down gear box or the like (not shown) so that the chains and their corresponding seats will be driven at a relatively slow rate of speed. As best shown in Figure 15, the teeth **112** on the selective engagement gear **107** are bevelled at their upper and lower edges so that the gear can slip into engagement with the sprockets even though the alignment for meshing is not perfect, there being sufficient play between the sprockets and their respective chains to permit this to happen.

The selective engagement mechanism above described is operated by means of a control board or panel **114**, Figure 1, adjacent the end of the seat row and a control panel (not shown) on each seat. Panel **114** will have a signal lamp and control button corresponding to each seat in the row, the signal lamp for each seat being illuminated when the seat is empty and dark when it is occupied. In this manner, the usher or patron can tell which seats are unoccupied and push the control button for one of these seats to bring it out to the loading and unloading zone **35**. Pushing the control button causes the worm gear and worm to move the selective engagement gear **107** into engagement with the sprocket on spindle **72** corresponding to the seat and thereafter actuates the motor **95** to drive the sprocket and chain connected thereto. When the seat reaches the loading and unloading zone, the motor is automatically stopped although the gear **107** remains in engagement with the sprocket. The control panel on the seat has only two buttons labelled "In" and "Out," and after the patron has seated himself in the seat he pushes the "In" button which again actuates the motor but in the reverve direction. When the seat reaches its row position, the motor is automatically stopped but the selective engagement gear remains in engagement with the sprocket for the seat until another seat is called for by means of the aisle control panel **114**, or until someone else in the row wishes to leave.

When a patron wishes to leave his seat, he pushes the "Out" button thereon and this causes the selective engagement gear **107** to move into engagement with the sprocket corresponding to his seat and actuates the motor **95** which moves the seat out to the loading and unloading zone. When the seat reaches this last-named point, the patron gets out and the usher or patron pushes the "In" button to return it to its row position. The aisle panel **114**, seat panels, prime mover **95** and motor for the worm gear **110** are preferably interconnected by a system of electric or electronic controls employing relays or the like, which controls are not disclosed herein since many different arrangements, both conventional and otherwise, can be employed. Accordingly, the electrical controls per se do not come within the scope of the present invention which is concerned only with the mechanical arrangement and apparatus for selectively moving any given seat from its group position to a point removed from the group and back again. It should be pointed out here, however, that any electrical controls employed will be provided with suitable interlocks to prevent movement of more than one seat at a time.

In order to keep dirt, papers and similar foreign matter from getting into the guideways **37**, **38**, the guideway top opening **48** through the platform **27**, Figures 7 and 8, is normally covered or sealed by a succession of relatively thick strips of resilient material **115** such as rubber or the like. The strips **115** are provided along one side with tabs **117** which extend into a groove **118** in the platform and are secured therein as by screws **120**. The opposite or free side of each strip is supported by a shoulder **121** on the platform so that the strips lie flush with the top surface thereof as shown in Figure 8. When any of the seats in row **21** or **22** is moved, a wedge shaped element **122**, called a "splitter," which is fixed to the spindle **47** for the seat engages the strips **115** and lifts the free side thereof up into the position shown in Figure 7 so that the spindle can pass along the platform opening **48**. A sleeve or roller **124** is loosely mounted on the spindle **47** above the splitter, and is adapted to turn freely as the strip **115** bears thereagainst to reduce the drag or friction between the parts. After the spindle has passed by, the natural resiliency of the strip material causes it to return to its horizontal position in engagement with the platform shoulder **121**, although a follower in the form of a spring metal strip or the like (not shown) can if desired be mounted on the seat support member **40** to positively return the strip to its sealing position.

Since the splitter **122** and chain connecting element **57** are both fixed to the spindle **47**, the former will turn with the latter as the seat moves from its branch guideway into the central guideway and vice versa. Thus, the splitter, or pointed end thereof, will always be properly positioned to engage and lift the strips **115** in the most effective manner. In this connection, it will be noted from Figure 2 that the strips **115** are arranged so that one continuous strip extends from the aisle terminal of the central guideway, around a right angle turn, and along

the first branch guideway **38** for row **21**; the second strip extends from the junction of the central guideway and first branch guideway to the end of the second branch guideway, and so forth. The branch guideways for the row **22**, however, are covered with strips which terminate at the junction of the branch and central guideways. This arrangement, of course, permits the spindle **47** on any seat to pass easily along the platform opening **48** since its splitter never has to lift an ungainly length of strip and the flexibility of the strips is greatest at the turns or junction points where the resistance to lifting would normally be increased.

As previously mentioned, the seats always face the front of the theater during movement to and from the loading and unloading zone **35** and, to this end, each seat is provided with a follower **125**, Figure 3, which travels in a shallow track **127**, Figure 2, cut in the upper surface of the platform **27** and resilient strips **115**. Since the track **127** extends alongside the central guideway and branch guideways, and the follower **125** is off center with respect to the center of the support member **40** (being located adjacent the front left hand leg **41** thereof) the follower holds the support member and seat in a forwardly facing position at all times. The follower comprises a rod **128** having a roller **130** on the end thereof which engages the sides of the track, the roller being urged into the track by a spring **131** which also provides the follower with a certain amount of "give" to compensate for any unevenness there might be in the track.

While the foregoing paragraphs have described the invention in connection with a seat group having four seats in each row, to simplify the drawings and disclosure, the arrangement will preferably provide for six seats in each row since it is common in theatre arrangements to have twelve or thirteen seats in a row between aisles. While seat group **24** operates toward the aisle **20**, it will be understood that the adjacent side group **25** operates in the opposite direction toward the next aisle to the right. It will also be understood that the seats can be staggered or offset as between the two rows in the group without in any way changing the operation of the apparatus. If desired, the groups comprising one complete row across the entire theatre can be arcuately arranged, or in amphitheatre form, so long as the seats within each group travel in straight line paths. The groups might also be arranged so that the first seat in each row, being adjacent the loading zone, is stationary but this would require greater clearance between the rows of adjacent groups and thus would reduce the number of seats that could be put in the theatre.

The above-described arrangement is laid out to provide the greatest possible comfort and safety for the patrons of theatre and, to this end, the movement of the seats is relatively slow and yet the transfer takes but a few seconds longer than the normal procedure of stepping sidewise in front of occupied seats in order to get into and out of an inner seat. There is practically no chance of involuntarily getting a hand or foot entangled during movement of a seat but in such event the motor **95** will be provided with an automatic stop which will operate whenever any strain beyond a certain limit is placed upon it. In this connection it should also be mentioned that the location of the motor **95** and the selective engagement mechanism is such that access is relatively simple being through a trap door **132**, Figures 1 and 13, in the unobstructed portion of the platform adjacent the loading and unloading zone.

From the foregoing description it will be apparent that the invention provides a novel and highly useful means for selectively moving objects arranged in a group or pattern to a point adjacent the group and back again, or vice versa. The invention has been particularly described with reference to theatre seats but any other type of object, large or small, can be temporarily or permanently mounted on the support members for transfer movement thereby. The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The embodiment disclosed is therefor to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims.

What I claim is:

1. In a theatre or like auditorium having a main aisle, the combination of a substantially horizontal platform adjacent said aisle, a group of individually movable theatre seats arranged in two rows on said platform at substantially right angles to said aisle, said rows being spaced apart to form a passageway therebetween which passageway terminates in a seat loading and unloading zone adjacent said aisle, a separate drive member for each seat positioned below said platform to move the seat out of its position in its row and along said passageway to said loading and unloading zone, and a single prime mover for each row of seats selectively engageable with any of the drive members for the seats in the row to actuate the drive member.

2. In an apparatus of the character described, a substantially horizontal platform, a group of individually movable support members arranged in two rows on said platform, said rows being spaced apart to form a passageway therebetween, a loading and unloading zone on said platform adjacent one end of said passageway, a central guideway below said platform in vertical alignment with the longitudinal center line of said passageway, a plurality of side guideways below said platform, each such guideway extending from a point beneath one of said support members to said central guideway, a separate endless drive member for each support member extending along the central guideway and the side guideway corresponding to the member to move the member out of its row position and along said passageway to said loading and unloading zone, and a single prime mover for each row of members to selectively actuate any of the drive members for the members in the row.

3. An apparatus as defined in claim 2 wherein the endless drive members for the support members in each row are vertically aligned in the central guideway adjacent a side wall thereof.

4. In a theatre or like auditorium having a main aisle, the combination of a substantially horizontal platform adjacent said aisle, a group of movable theatre seats arranged in two rows on said platform at substantially right angles to said aisle, said rows being spaced apart to form a passageway therebetween which passageway terminates in a seat loading and unloading zone adjacent said aisle, a central guideway having substantially vertical side walls and located below said platform in vertical alignment with the longitudinal axis of said passageway, a pluarlity of side guideways below said platform, each such guideway being in communication with said central guideway and extending outwardly therefrom to a point beneath one of said seats, said central and side guideways having a coextensive top opening through said platform, a separate endless drive member for each seat positioned in the central guideway and the side guideway corresponding to the seat, means passing through said top opening and connecting each seat with its drive member to enable the latter to move the seat out of its row position and along said passageway to said loading and unloading zone, and a single prime mover for each row of seats positioned below said platform to selectively actuate any one of the drive members for the seats in the row.

5. The combination defined in claim 4 wherein said drive members positioned in said central guideway are arranged one above the other adjacent the guideway sidewalls.

6. The combination defined in claim 4 wherein said means connecting each seat with its drive member includes a spindle having guide elements thereon adapted to engage the guideway sidewalls.

7. The combination defined in claim 4 including resilient means normally closing said guideway top opening, said resilient means being distortable to permit passage of said seat and drive member connecting means along said opening during movement of the seat to said loading and unloading zone.

8. The combination defined in claim 4 including a track on said platform and means on each seat engageable with said track to prevent pivotal movement of said seats during movement thereof between said rows and loading and unloading zone whereby said seats face in the same direction at all times.

References Cited in the file of this patent

UNITED STATES PATENTS

512,066	Spitzer	Jan. 2, 1894
766,107	Francovich	July 26, 1904
1,000,106	Morris	Aug. 8, 1911
1,040,411	Raymond	Oct. 8, 1912
1,437,536	Mason	Dec. 5, 1922
1,517,774	Duprey	Dec. 2, 1924
1,584,212	Burrel	May 12, 1926
1,944,253	Martin	Jan. 23, 1934
2,469,575	Ralston et al.	May 10, 1949
2,658,632	Baume	Nov. 10, 1953

FOREIGN PATENTS

236,616	Great Britain	July 2, 1925